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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/798,134

03/10/2004

Andrew Jay Skoog

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EXAMINER

SAVAGE, JASON L

ART UNIT

PAPER NUMBER

1775

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/798,134

Applicant(s)

SKOOG ET AL.

Examiner

Jason L. Savage

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9,11,12,14,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2, 4-9,11,12,14,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7-23-07 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-2, 4-9, 11-12, 14 and 17-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding the limitation in claims 1 and 12 that the heating applied to the powder coating is applied "in a single step", the Examiner could not find a basis to limit the invention to exclude other processes which employ more than one heating step to cause the glass and ceramic particles to react.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1, 11-12, 14 and 17-18 are rejected under 35 U.S.C. 103(a) as obvious over Andrus et al (US 5,250,360) in view of either Daly et al (US 2004/0068027) or Ilenda et al. (US 2004/0063817).

Andrus teaches a method of forming protective coatings on turbine engine components (col. 1, ln. 4-28). Andrus teaches the powder coating material is powdered glass frits having ceramic materials trapped within the glass matrix (col. 8, ln. 33-50). Andrus further teaches the method of forming the coating is electrostatically spraying a dry powder coating material directly onto the component body surface (col. 6, ln. 27-36). Andrus teaches the applied coating is fired at a temperature about 1000°C causing the glass and ceramic to react to form a fused and cured crystalline coating (col. 6, ln. 37-47).

Regarding the limitation that the heating of the applied powder coating to... 'react the ceramic particles with the glass... wherein the heating melts and fuses the particles of the powdered coating' is performed in a single step (emphasis added), the claim language for the claimed method recites comprising. As such, the claim is open to other steps which are not positively recited. Although Andrus teaches a pre-heating step to soften the glass particles prior to the subsequent step which reacts and fused

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the particles, the claim language does not exclude such a pre-heating step. As is described by Andrus, the powder coating materials are applied to the substrate and heated by firing which would meet the claim limitation of heating in a single step to react the coating materials (col. 8, ln. 55-68). As further evidence of the heating being performed in a single step, Andrus teaches the glass coating is fired in one temperature range (col. 2, ln. 15-19).

In the alternative, Andrus teaches that the invention seeks to improve upon conventional methods of protecting turbine components which failed to permit the glass coating material to soften and flow into a continuous glass coating before firing (col. 3, ln. 25-43). As such, Andrus teaches that heating of the glass frit powder coating without a preheating step is a conventional and well known method for forming the coating making the claim limitation obvious. Although, Andrus teaches the coatings formed by the prior art methods exhibited undesirable characteristic, all the disclosures in a reference must be evaluated for what they fairly teach one of ordinary skill in the art even though the art teachings relied upon are phrased in terms of a non-preferred embodiment or even as being unsatisfactory for the intended purpose, *In re Boe*, 148 USPQ 507 (CCPA 1966); *In re Smith*, 65 USPQ 167 (CCPA 1945); *In re Nehrenberg*, 126 USPQ 383 (CCPA 1960); *In re Watanabe*, 137 USPQ 350 (CCPA 1963).

Regarding claim 11, although Andrus does not explicitly recite the substrate in the turbine component is non-metallic, it would have been within the purview of one of ordinary skill in the art at the time of the invention to have recognized that a wide variety

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of materials could be employed with a reasonable expectation of success including non-metallic substrates such as is claimed.

Regarding claim 12, Andrus meets the claim limitations as set forth above.

Regarding claim 14, Andrus teaches multiple embodiments wherein the heating temperature is between 1100-1200°C for approximately 1 hour (Table III).

Regarding claim 17, Andrus teaches the powdering is applied directly to the gas turbine engine substrate component (col. 8, ln. 55-68).

Regarding claim 18, Andrus teaches that electrostatic spraying may be used to apply the powder coating material to the substrate (col. 6, ln. 27-36).

Claims 4-9 are rejected under 35 U.S.C. 103(a) as obvious over Andrus et al (US 5,250,360) in view of either Daly et al (US 2004/0068027) or Ilenda et al. (US 2004/0063817).

Regarding the limitation in claim 2 that the powder coating is applied using a fluidized bed or an electrostatic brush, although Andrus does not teach the claimed processes, it teaches that the powder coating material may be applied in any conventional manner (col. 6, ln. 27-29).

Daly teaches powder coatings which are readily applied using little or no organic solvents (par [0002]). Daly further teaches that electrostatically deposited the coatings conventionally applying the coating material using a fluidized bed, a magnetic brush or spray nozzle (par[0053]).

Ilenda teaches powder coatings having enhanced properties (par [0001-0002]). Ilenda further teaches that conventional methods for deposited powder coatings include using electrostatic spraying, a fluidized bed or a magnetic brush (par[0108]):

As such, it would have been obvious to one of ordinary skill in the art to have used any conventional deposition process including electrostatic spray, fluidized bed or magnetic brush applications with a reasonable expectation of success of forming the powder coating of Andrus.

Regarding claim 4, Andrus teaches that the turbine body is electrically grounded (col. 6, ln. 32-33). In the alternative, it would have been obvious to have grounded the substrate body.

Regarding claims 5-7, Andrus teaches that the coatings may contain the claimed materials (col. 5, ln. 62 – col. 6, ln. 26).

Regarding claim 8, the coating of Andrus meets the limitation of being a thermal barrier.

Regarding claim 9, Andrus is silent to the component body being cleaned prior to the application of the coating. However, the claimed pre-coating cleaning is a conventional processing step. It would have been within the purview of one of ordinary skill in the art at the time of the invention to have employed a cleaning step prior to the deposition of the coating to have insured the coating would form a suitable bond with the substrate body.

Claims 1-2, 4-9 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ring et al. (US 6,531,524) in view of Nesbitt (US 2004/0115477).

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Ring teaches that is known to apply powder coatings directly onto substrates by electrostatic deposition wherein the particles are charged with a voltage or by the use of tribo-charging (col. 1, ln. 14-21). Ring further teaches that it is known to heat the powder coatings to melt and fuse the particles to form a cured coating (col. 1, ln. 21-27). Ring also teaches that the coatings may be applied in dry form without organic solvents (col. 1, ln. 25-27). Ring is silent to the coatings being formed on turbine engine components.

Nesbitt teaches a method of electrostatically coating a gas turbine engine component such as a turbine fan blade with a powder coating wherein the coating is applied in dry form and produces a coating having enhanced uniformity and density in all areas despite the component to be coated having an odd or angular shape (par [0147]).

It would have been obvious to one of ordinary skill in the art at the time of the invention recognized that the method of coating substrates as taught by Ring could have been employed in coating a wide variety of substrates including turbine engine components such as is taught by Nesbitt.

Regarding the limitation that the powder coating is applied using a fluidized bed or an electrostatic brush, Ring teaches that the powder coating may be applied by any suitable process of powder coating including by fluidized-bed (col. 17, ln. 65 – col. 18, ln. 2).

Regarding claim 4, both Nesbitt and Ring teach that electrical grounding is employed and Ring explicitly recites that the grounding of the substrate component is employed (col. 1, ln. 15-17).

Regarding claims 5-7, Ring teaches that the coatings may contain the claimed materials (col. 6, ln. 30-57).

Regarding claim 8, since coating of Ring as modified by Nesbitt teaches that the powder coating contains the same materials as disclosed in claim 5 and further teaches that the coating is for a turbine component, it is the position of the Examiner that the coating would meet the limitation of being as much of a thermal barrier as that claimed by Applicant.

Regarding claim 9, Nesbitt teaches the substrate may be cleaned (par [0022]). As such, it would have been obvious to one of ordinary skill in the art to have cleaned the substrate prior employing the coating method of Ring.

Regarding claim 11, although the references do not explicitly recite the substrate in the turbine component is non-metallic, it would have been within the purview of one of ordinary skill in the art at the time of the invention to have recognized that a wide variety of materials could be employed with a reasonable expectation of success including non-metallic substrates such as is claimed.

Regarding claim 12, Ring in view of Nesbitt teaches the claim limitations as set forth above.

Regarding claims 13-14, Ring and Nesbitt are silent to the exact processing parameters used when subjecting the coated component to the heating step. However,

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it would have been within the purview of one of ordinary skill in the art to have selected a heating temperature and duration that would insure the powder material that is applied would be able to melt, fuse and subsequently form the cured coating layer as described by the prior art. Absent a teaching of the criticality or showing of unexpected results, the claimed heating temperature and time would not provide a patentable distinction over the prior art.

Response to Arguments

Applicant's arguments filed 12-20-06 have been fully considered but they are not persuasive.

Applicant argues that Andrus does not disclose or suggest Applicant's claims wherein a fluidized bed or an electrostatic brush technique is employed. However, as was set forth in the rejections above, Andrus teaches that the powder coating material may be applied in any conventional manner (col. 6, ln. 27-29). As such, it would have been obvious to one of ordinary skill in the art to have employed other conventional coating processes including those claimed with a reasonable expectation of success.

Applicant also argues that Nesbitt requires the use of a wet bonding material layer to which dry particles adhere and fails to disclose or suggest the claimed deposition technique of a fluidized bed process or electrostatic brush deposition. However, the rejection is based on the method of Ring, which teaches that is known to apply powder coatings directly onto substrates (col. 1, ln. 14-21). Ring further teaches that the powder coating may be applied by any suitable process of powder coating

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including by fluidized-bed (col. 17, ln. 65 – col. 18, ln. 2). It would have been obvious to one of ordinary skill in the art at the time of the invention recognized that the method of coating substrates as taught by Ring could have been employed in coating a wide variety of substrates including turbine engine components such as is taught by Nesbitt.

Nesbitt is merely provided as a showing that application of powder coatings to turbine components is known. As such, the argument that Nesbitt employs the use of a wet bonding layer in Nesbitt's method of applying the coating is not persuasive since it is the method of Ring that reads on the claims. Furthermore, as was recited above, Ring as modified by Nesbitt would meet the limitation that the powder coating is applied using a fluidized-bed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jason Savage
9-14-07



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9/17/7